

WE CLAIM:

1. A method for preparation of an anode for a solid oxide fuel cell comprising the steps of:

mixing a porous matrix material with a yttria-stabilized-zirconia (YSZ) powder, forming a porous matrix material/powder mixture; forming said porous matrix material/powder mixture into a porous YSZ layer; calcining said porous YSZ layer; and impregnating said porous YSZ layer with a metal-containing salt solution.

2. A method in accordance with Claim 1, wherein said porous matrix material comprises a plurality of zircon fibers.

3. A method in accordance with Claim 1, wherein said metal-containing salt solution comprises a nitrate salt of a metal selected from the group consisting of Cu, Ni and mixtures thereof.

4. A method in accordance with Claim 1, wherein said porous matrix material/powder mixture is mixed with glycerol and applied to an anode side of a YSZ electrolyte, forming said porous YSZ layer on said anode side of YSZ electrolyte.

5. A method in accordance with Claim 1, wherein said porous matrix material/powder mixture is added to a tapecast and said tapecast is deposited onto an anode side of a YSZ electrolyte layer, forming said porous YSZ layer on said anode side of YSZ electrolyte.

6. A method in accordance with Claim 5, wherein a cathode is applied to a cathode side of said YSZ electrolyte layer after said calcining of said porous YSZ layer.

7. A method in accordance with Claim 1, wherein a metal content of said porous YSZ layer is at least about 35% by weight of said porous YSZ layer.

8. A method in accordance with Claim 1, wherein said impregnated porous YSZ layer is calcined.

9. A method in accordance with Claim 1, wherein said porous YSZ layer is impregnated with ceria.

10. A method in accordance with Claim 9, wherein said ceria constitutes in a range of about 5% to about 40% by weight of said porous YSZ layer.

11. A method for producing a solid oxide fuel cell comprising the steps of:

mixing a porous matrix material with a yttria-stabilized-zirconia (YSZ) powder, forming a porous matrix material/powder mixture;

mixing said porous matrix material/powder mixture with glycerol, forming a slurry;

applying said slurry to an anode-facing face of a dense YSZ electrolyte layer, forming a porous anode layer/electrolyte layer assembly;

calcining said porous anode layer/electrolyte layer assembly;

applying a cathode layer to a cathode-facing face of said electrolyte layer, forming a fuel cell assembly;

impregnating said porous anode layer with a metal-containing salt solution; and

calcining said impregnated porous anode layer.

12. A method in accordance with Claim 11, wherein said metal-containing salt solution comprises a nitrate salt of a metal selected from the group consisting of Cu, Ni and mixtures thereof.

13. A method in accordance with Claim 12, wherein a metal content of said calcined impregnated porous anode layer is at least about 35% by weight of said calcined impregnated porous anode layer.



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14. A method in accordance with Claim 11, wherein said porous matrix material comprises a plurality of zircon fibers.

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